

REMARKS/ARGUMENTS

Remarks

The Examiner has rejected claims 1, 2, and 4-7, under 35 USC 103A, as being unpatentable over Smith in view of Koba. The Smith device is a feed roller for a chipping machine. A chipping machine of this type is made specifically for chipping large pieces of wood and its operation depends on large pieces of wood being fed directly into the chipping wheel. As the large pieces of wood are pressed against the rotating disk of the chipper wheel, with the wheel placed at an angle to the direction of travel of the tree, a blade on the chipper wheel rotates rapidly and removes a thin slice of wood off of the tree at every rotation.

The feed roller of Smith discloses angle rails 48 A and 48 B which occupy approximately the outer third of the sides of the feed roller. The angled rails 48 are provided for directing the branches towards the trunk of the tree. The mid section of the drum is provided with a number of toothed ribs "providing comb-like teeth" which engage the tree from above. Because of the angled position of the chipping wheel in relation to the direction of travel of the tree, the chipping wheel does not tend to drive the tree backwards into the feed roller. Also the chipping wheel is designed to come in contact with the entire trunk of the tree, and grinds off the entire trunk of the tree as it is pressed into the chipping wheel, so there is no need for agitation of the material to be ground.

The feed roller of the invention is designed specifically for use in horizontal grinders. Claim 1 has been revised to include the use of the feed roller with horizontal grinders. In a horizontal grinder, the feed roller presses material towards a hammermill which has an axis that is parallel to the axis of the feed roller. The hammermill is constructed with hammers that extend out from the generally cylindrical hammermills. The hammers of the hammermill do no overlap each other, so if a piece of wood such as the tree trunk which would be ground by the Smith patent were fed into a horizontal hammermill, the hammers would grind into the trunk of a tree, and form slots in the trunk of the tree. However there would be places on the tree trunk which would be untouched by hammers, and these would extend between the hammers and would eventually contact the cylindrical drum of the hammermill. When they contacted the drum of the hammermill between the teeth, the fingers of wood would press against the cylinder of the hammermill and become hot, smoke, and could eventually catch fire and burn.

Another dynamic that happens with a horizontal hammermill is that the hammers are striking the material being fed into the hammermill in a head-on direction. Thus the hammers tend to drive the material to be ground straight back into the hammermill. A straight row of teeth has to absorb this rebound energy, and may be broken off or bent from the force of the material driven back. An angled row of teeth is better able to deflect the rebound energy, and not be bent or broken.

The generally chevron shaped rows of teeth of the present invention address these problems, which are not solved by the feed roller of Smith, and for which the feed roller of Smith would not work. The generally chevron shaped rows of teeth of the present invention tend to move material to be ground towards the center of the feed roller. This movement is assisted by material from the outside of the feed roller moving towards the center. As this material moves towards the center, it agitates the material which is located in the center, and keeps the whole mass in movement, with some continual lateral. This solves the problem of material being pressed straight forward between the teeth of a hammermill. As material is pressed forward it is inevitably moved from side to side by the chevrons, and by material being moved towards the center by outside rows of teeth in a chevron pattern.

Additionally, as the material is driven straight back by blows of the hammers, the angled rows of the chevron shaped rows of teeth serve to deflect the energy of being driven straight back, so that energy is not directed straight into the teeth. In the feed roller of Smith, the rows in the center of the feed roller would receive the impact from such ejected material, and practice has shown that these teeth would be much more susceptible to breaking in the configuration of Smith than if they were in a chevron shape.

Additionally, the feed roller of Smith shows only straight rows of teeth in the center portion of the feed roller, with angled rows at the outer periphery of the feed roller. What is claimed in this application is rows of teeth which extend from the periphery of the feed roller to the center.

The device disclosed by Koba is a plywood dewatering roller, with an upper roller and lower roller. The lower roller is covered by an elastic covering made of urethane rubber. The upper roller is made of solid metal which is machined to have very small gripping structures, which they call projection 3a and 3b. These are formed by first cutting a spiral groove in the metal, as shown in figure 5. Then other tools are used to form the projection 7 on either side of the spiral groove as shown. Finally, as shown in Figure 8 the projections are formed by cutting the projection 7 at an angle. This leaves projections which are 1.5 mm high, and are generally pyramidal in shape and 2 mm apart. These are tiny gripping projections which cover the upper roll. A sheet of plywood is passed between the upper and lower rollers and squeezed to sixty percent of its original thickness. The squeezing causes part of the water contained within the sheet of plywood to be mechanically squeezed out, thus dehydrating the greenwood veneer sheet.

The Examiner notes that the device of Koba is in a closely related art and therefore the feed device of Koba with its gripping projections are considered. The roller of Koba is not a feed roller, and it does not grip material and feed it into a hammermill. It is a compression roller which is used to press straight down on plywood veneer being fed between the two rollers. The Examiner suggests that the chevron shape arrangement of the projections of Koba are present to move material toward the center. The tiny projections on the compression roller of Koba are not provided to move material to the center of Koba. Since the material being fed through the roller

of Koba is a sheet of plywood veneer, it would be impossible to move it toward the center. It passes through the rollers exactly as it enters, and merely goes through the rollers for purposes of compression and mechanically squeezing water out of the veneer.

Amendments in General

1. Applicant presents the following amendments and arguments in response to the Examiner's Office Action, which cited new references against the Applicant. In as much as the Applicant has not had an opportunity previously to respond to any arguments or rejections made by the Examiner in view of these references, Applicant respectfully requests that these amendments be entered and that consideration of the aforementioned arguments take place.
2. Claims 1 and 8 have been amended to clarify that the rows of teeth extend to a central location in a general V or chevron shape. This feature is fully supported by the claims of the specification and adds no new matter to the application, and acceptance of these amendments and withdrawal of the Examiner's rejections in view of these amendments is respectfully requested. Revised claims 1 and 8 also include the limitation that the feed roller is for use with a horizontal hammermill.
3. Claim 4 has been canceled from the Application and the limitations set forth therein incorporated into Claim 1.
4. Claim 5 has been canceled from the Application.

Claim Rejections - 35 USC §102

5. The Examiner rejected claims 1, 2 and 4-7 under §102(b) as being anticipated by Smith.
6. "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 828 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). MPEP § 2131.
7. Claims 1 and 8 have been amended to include the limitation that the rows of teeth extend toward the center in a generally chevron or V shaped type of arrangement, and that the feed roller is used in conjunction with a horizontal hammermill for the purpose of agitation and movement of material to the center of the hammermill.

8. The Smith reference does not teach these features. The Smith reference teaches sets of flights that extend to a set of teeth. However, flights are not teeth and the flights do not extend all of the way to the generally mid-circumferential axis, as the claims of the present invention require. Smith is also not directed to a horizontal hammermill.
9. Furthermore, the Smith device includes teeth, which are generally perpendicularly oriented with regard to the orientation of mid-circumferential axis. This is also expressly disclaimed in the claims of the present invention.
10. These features are specifically included in the claims of the present application, not shown or described in the Smith reference, and the features which are shown in the Smith reference are specifically disclaimed in the description of the present invention. Therefore, Applicant respectfully submits that the Smith reference is not an anticipatory prior art reference.

Claim Rejections - 35 USC § 103

11. The Examiner rejected claims 8 and 9 under §103(a) as being unpatentable (obvious) in view of Smith when combined with Peterson.

It appears that the Examiner is formulating an obviousness rejection by finding the claimed features in separate and apparently unrelated patents. More than this is required because every invention is made of components that are likely to exist in form in another invention. There still is a requirement to show a teaching, suggestion, or motivation for combining these features, as indicated in the recent PTO guidance from Deputy Commissioner Margaret A. Focarino on May 3, 2007. However, the TSM analysis may not be rigidly applied. In this case there are structures which appear to be generally chevron shaped in Koba, but they are not provided for centering or agitating material, and are not for use with a horizontal hammermill. They would not function to grip material for feeding into a hammermill, and would not function to withstand force transmitted from blows of a hammermill. They are merely to provide grip on an otherwise smooth steel drum so that pressure can be applied to the sheet of the veneer passing through it.

The device of Smith is a feed roller for a different type of hammermill, and for the type of hammermill utilized it probably functions very well. However the feed roller of Smith would not function very well for a horizontal hammermill grinding debris of multiple sizes, such as tree branches, scrap lumber, and other material of various sizes. The teeth of Smith are specifically adapted to hold a tree trunk, for the side rollers to break off tree branches, and for the assembly of rollers to feed the tree trunk straight into a chipper blade held at an angle.

If the tiny projections of Koba were combined with the feed roller of Smith, the device would not work because the projections of Koba are not really gripping teeth in the same matter as disclosed in the same matter. They are tiny pyramid shaped projections which are sufficient to

propel a sheet of veneer forward as it being pressed between two compression rollers. The Examiner also cites Peterson, U.S. Patent 4,721,139 as a patent for combination with Smith and Koba for rejections of claims 3, 8 and 9. Peterson is a debarking machine that includes a feed roller which is square in cross section. Attached to the square feed roller are rows of teeth which are arranged with decreasing or increasing tooth height. The square shape of the roller causes logs to bounce as they contact the square feed roller. The high and low teeth cause a side to side movement of the logs which induces the spreading of the logs along the feed roller.

There is no suggestion, teaching nor motivation to combine the feed roller of Peterson with that of Smith and Koba. The feed roller of Peterson is square and not round, and there is no indication of the desirability of any kind of a chevron shaped row of teeth. As noted in the above discussion, more is required to sustain an obviousness rejection, than merely to find a component of the invention in an apparently unrelated prior art patent. As noted in the recent PTO guidance from Deputy Commissioner Focarino, "it remains necessary to identify the reason" that prior art should be combined. Commissioner Focarino notes that "in order to determine whether there was an apparent reason to combine the known [prior art] elements in the fashion claimed by the patented issue, the analysis should be made explicit." We believe that the Examiner's analysis is deficient in not identifying reasons for combining the cited prior art patents, nor making the analysis explicit concerning the reason to combine the referenced elements.

In the KSR case, the Supreme Court notes that the analysis set forth in *Graham v. Deere* is still the proper analysis for evaluating obviousness. Within the context of *Graham v. Deere*, the teaching-suggestion-motivation analysis can still be utilized, but the analysis of *Graham v. Deere* is still the framework for an obviousness analysis. *Graham v. Deere* sets forth several factors which can be used to evaluate consideration which are useful for evaluating obviousness. Several of those considerations will be discussed below. One factor to be considered in the *Graham v. Deere* analysis is the commercial success of the device. As noted in the Declaration of Carl Bonner, the design of the invention is successful enough that their main competitor is copying it.

An analysis for obviousness under *Graham v. Deere* requires that the scope and content of the prior art be determined. The differences between the prior art and the claims at issue are to be ascertained, and the level of the ordinary skill and the pertinent art resolved.

The scope and content of the prior art are illustrated by the patents found by the Examiner and those submitted by the applicant. These prior art patents include Koba, Smith, and Peterson.

The differences between the prior art and the claims at issue are discussed above.

The level of ordinary skill in the pertinent art is also an issue. The assignee of the current application is Diamond Z Manufacturing, which has been in the business of producing industrial size grinding machines of various types for 18 years. The employees of Diamond Z

have been active participants in this industry, by going to tradeshow, evaluating competitors' products, feel testing their own products, revising their products to improve their performance and incorporating features not only to improve performance, but also adding features not found in competitors' products. The competitors in this field are a small number of companies and generally the product of one manufacturer becomes known to manufacturers of competing lines in the field of grinding.

Background

The applicant Mr. Carl Bonner is the head research and development coordinator at Diamond Z Manufacturing. He has been involved in designing grinder machines for approximately fourteen years. In this role he is in charge of designing all of the systems of new grinding machines for Diamond Z Manufacturing.

Diamond Z Manufacturing was formed in 1988 and began manufacturing grinders in late 1989. Prior to the formation of Diamond Z Manufacturing, the founders worked in a self-employed capacity in the grinding business, and built their own grinding machines for use in that business. Mr. Bonner has worked in various roles with heavy machinery for approximately 34 years. During this time he has gained skills in all phases of the technologies involved in building grinding machines, such as those built by Diamond Z Manufacturing. His skills include welding, hydraulics machining, fabricating, and designing.

In his position as Research and Development Coordinator for Diamond Z Manufacturing, he is familiar with many, if not all, commercial grinders that are on the market including those of competitors. These include tough grinders, horizontal grinders, grinders for wood, grinders for animal feed and grinders for construction debris.

In the field of horizontal grinders it was found that increased agitation of the material being fed was required. The pattern of gripper teeth of the invention causes agitation of the material being fed, and moves material towards the center of the hammermill. This solved the problem of wood being forced straight forward and some of it being pressed between the tips of the hammers and the drum of the hammermill itself.

A problem that was reported to us by customers when using a horizontal grinder was that with more powerful hammermills, material would be driven back and could break gripper teeth off the feed roller. Having the teeth angles to that force helps reduce breakage of hammermill teeth.

Conclusion

Reconsideration and allowance of the application as amended is respectfully requested.

If the Examiner feels it would advance the application to allowance or final rejection, the Examiner is invited to telephone the undersigned at the number given below.

DATED this 30th day of July, 2007.

Yours very truly,

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CERTIFICATE OF MAILING

I HEREBY CERTIFY that this correspondence is being transmitted to the United States Patent and Trademark Office by EFS-Web on the date below.

DATE: July 30, 2007

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